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Science and Exploration for Curious Kids

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Science and Exploration for Curious Kids

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Suggested for ages 7 to 10.



page 9

Are cats ever really tame?

Departments

2 Nosy News

4 Nestor's Dock

29 Ask Jimmy and The Bug

30 Contest and Letters

33 Plush's Perfect Projects

back cover: Marvin and Friends



page 12

Do I look wild to you?



What am I saying?

page 27

Features

6 From Wild to Mild
by Ellen R. Braaf

13 Tiger Tabby's
Family Photos
by Tiger Tabby

16 Born to Hunt
by Meg Moss

20 Saving the Tigers
by Cynthia Graber

26 How to Speak Cat

28 If I Fits, I Sits
by Tracy Vonder Brink

page 25

Can we save the tiger?



Tiger or tabby?



page 13





by Tracy
Vonder
Brink



Scuba-Diving Lizard

Anoles are lizards that live in many warm areas of the Americas. The little reptiles make a tasty snack for predators like birds and snakes, so hiding in trees is the way many anoles stay safe. One kind of anole that lives in Costa Rica has a special trick to avoid being eaten—it dives underwater with an air bubble over its nose.

Researcher Lindsey Swierk studies water anoles and had seen them make bubbles. She knew the lizards could stay

underwater for more than 15 minutes at a time. She wondered if the bubbles helped them do it, like an air tank helps a scuba diver.

To find out, she put a temporary coating on some water anoles so that any bubbles they blew wouldn't stick to their skin. Then she timed how long they stayed underwater. She did the same with some whose skin she hadn't coated. She found bubble-blowing anoles were able to stay underwater 32% longer than the anoles whose bubbles didn't last.

Swierk is excited about her research because while some insects and spiders are known to use air bubbles underwater, it's not something many other animals do. She plans to keep studying the diving lizards to learn even more about them and their bubbles.



Plush will never find me underwater!

Are you sure?



CUTTING WITH PAPER

What do you do when you get a paper cut? Say "ouch" and look for a bandage? Scientist Kaare Jensen decided to find out more about just how paper cuts. He didn't find volunteers who wanted to get paper cuts, so instead of fingers, he used a type of gelatin that acts like human skin. He and his team tested all kinds of paper to see which cut blocks of the gelatin best.

A regular metal knife cuts best when its edge is as thin as possible. But thin paper bent and folded instead of cutting. Thicker paper dented the gelatin but wasn't able to cut it. The most dangerous paper is about 65 micrometers (less than 3 thousandths of an inch) thick. That's about the thickness of old-fashioned dot-matrix printer paper—and magazine pages!

RING AROUND THE PLANET?

Saturn is famous for its hundreds of rings. They're made up of small bits of ice and dust and are huge—they stretch out from Saturn as far as the distance from Earth to the moon. Jupiter, Neptune, and Uranus also have rings, but they're small and faint. Some scientists think Earth may once have had rings too.

Around 466 million years ago, a lot of meteorites crashed into Earth and left craters. A team of scientists mapped 21 of the craters. They found the craters were all in a pattern near the equator and not scattered around randomly. They think the craters formed that way because Earth had rings.

The scientists say a large asteroid could once have come near Earth and broken up into rings. (Saturn's rings probably formed in much the same way.) When the bits of asteroid later dropped to Earth as meteorites, they fell in a ring-like pattern around the equator.

Earth also started cooling rapidly around the same time. In fact, that period became one of the coldest in the past 500 million years. The scientists think Earth's rings could have caused that too—if they blocked out the sun and cast a shadow on enough of the planet.

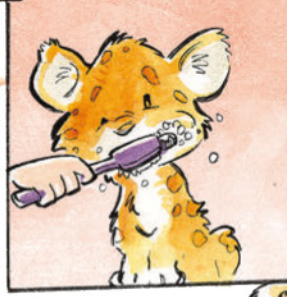
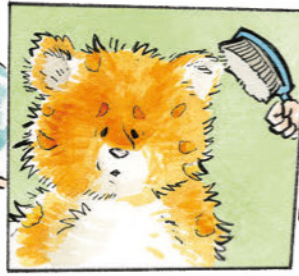
What did Earth say to the asteroid?
"Give me a ring sometime!"



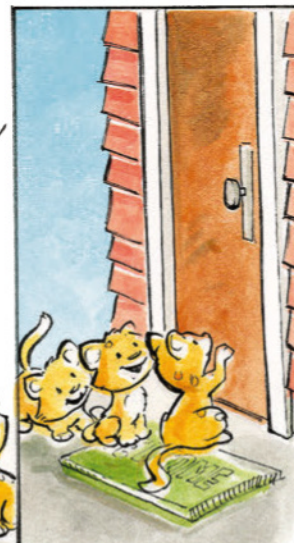
The researchers also found that the angle of the paper makes a difference. Paper with its edge pressed straight down into the gelatin was less likely to cut than if it was slanted. Based on what they learned, the team made a paper knife they called the paper machete. It has a 3D printed handle that can be loaded with paper blades, and it can cut fruit and even chicken! But each blade can be used only once.

My advice: Be careful turning the pages of this magazine!





by Jeffrey Ebbeler



From

by Ellen R. Braaf
art by Mark Brewer

WILD

to

Dogs have been living with humans for about 12,000 years—about twice as long as cats have. In that time, dogs have changed a lot from their wolf ancestors. Like many domestic animals, adult dogs keep the look of youngsters, with big heads and round eyes. They have lost their killer instincts and learned to like human company. They are cute, social, and trusting. These changes help them fit into a life with humans.

But cats are, well, different.

Although cats are happy to live in human houses and eat our food, they have stayed more like their wild relatives than have dogs, cattle, horses, or sheep. So how did these little tigers move into the living room?

Can you tell from these teeth that cats have evolved to eat nothing but meat?



Mild

You can take the cat out of the wild, but you can't take the wild out of the cat.



Cats are a mix of opposites—quiet purrs and cutting teeth, soft fur and razor claws. House cats have lived with humans for thousands of years, but in many ways they're still tigers on the inside.

It's a Cat's Life

Felids—as scientists call members of the cat family—are very adaptable. Some kind of cat lives in almost every environment on Earth. Lions rule the open grasslands. Tigers lurk in dense forests and jungles. Leopards hunt mainly at night and climb trees easily. Jaguars slosh through rivers, swamps, and streams. And cougars pad over rocky slopes and through deep snowdrifts.

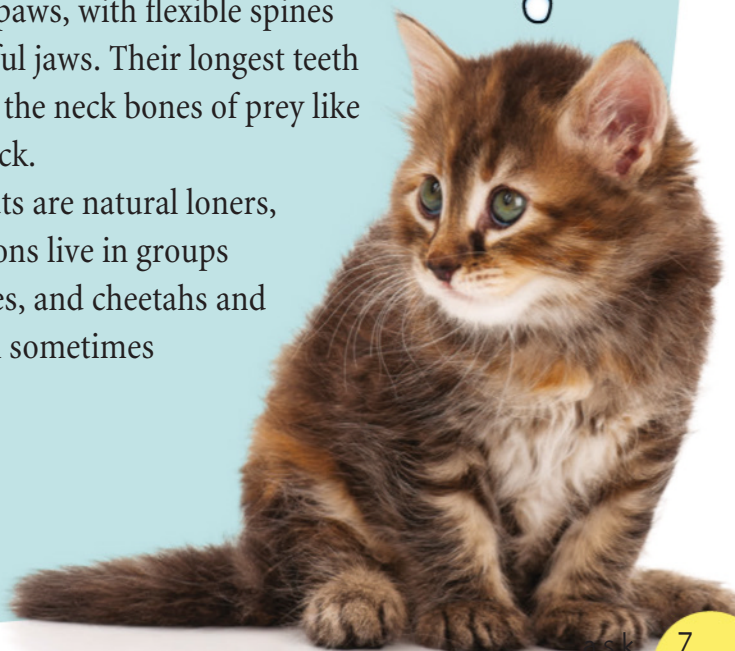
What's all the fuss about?



All cats are hunters. They eat meat, and their bodies are built for power, speed, and stealth. They walk tiptoe on cushioned paws, with flexible spines and powerful jaws. Their longest teeth fit between the neck bones of prey like keys in a lock.

Most cats are natural loners, although lions live in groups called prides, and cheetahs and jaguars will sometimes

Are you SURE I'm related to that guy?





on their faces, tails, and feet. These smells might signal "Keep out!" or "Looking for a mate?" Sometimes cats put their scent marks over other cats' marks to say,

"You don't scare me." Claw marks on nearby trees say, "Pay attention!"

Cat Kin

The cat's family story begins about 60 million years ago with a small tree-climbing mammal a bit like a weasel. This animal hunted small prey with a special pair of knife-like teeth. Over time, as these teeth became more deadly, cats evolved into meat-eating specialists. In fact, they have completely lost the ability to digest plants.

The closest wild relatives of modern house cats are the small wildcats of Africa, Europe, and Asia. Our house cats are probably descended from a Middle Eastern wildcat.

Streamlined bodies, strong hearts, and large lungs help speedy cheetahs outrun any animal on land.

roam in pairs. But unlike dogs, cats don't care about getting along with a pack, following a leader, or learning social rules. Cats like to be their own bosses and often see other cats as intruders, not friends.

But even if they live and hunt alone, cats big and small are part of a loose cat society. Cats are territorial, so meeting other cats can lead to fights. Cats let other cats know they're around from a distance, with sounds and scents. Only lions, tigers, jaguars, and leopards can roar, but other cats make a variety of noises, from hissing to a friendly purr.

Cats leave smell messages for one another with pee, poop, spit, and smelly chemicals from scent glands

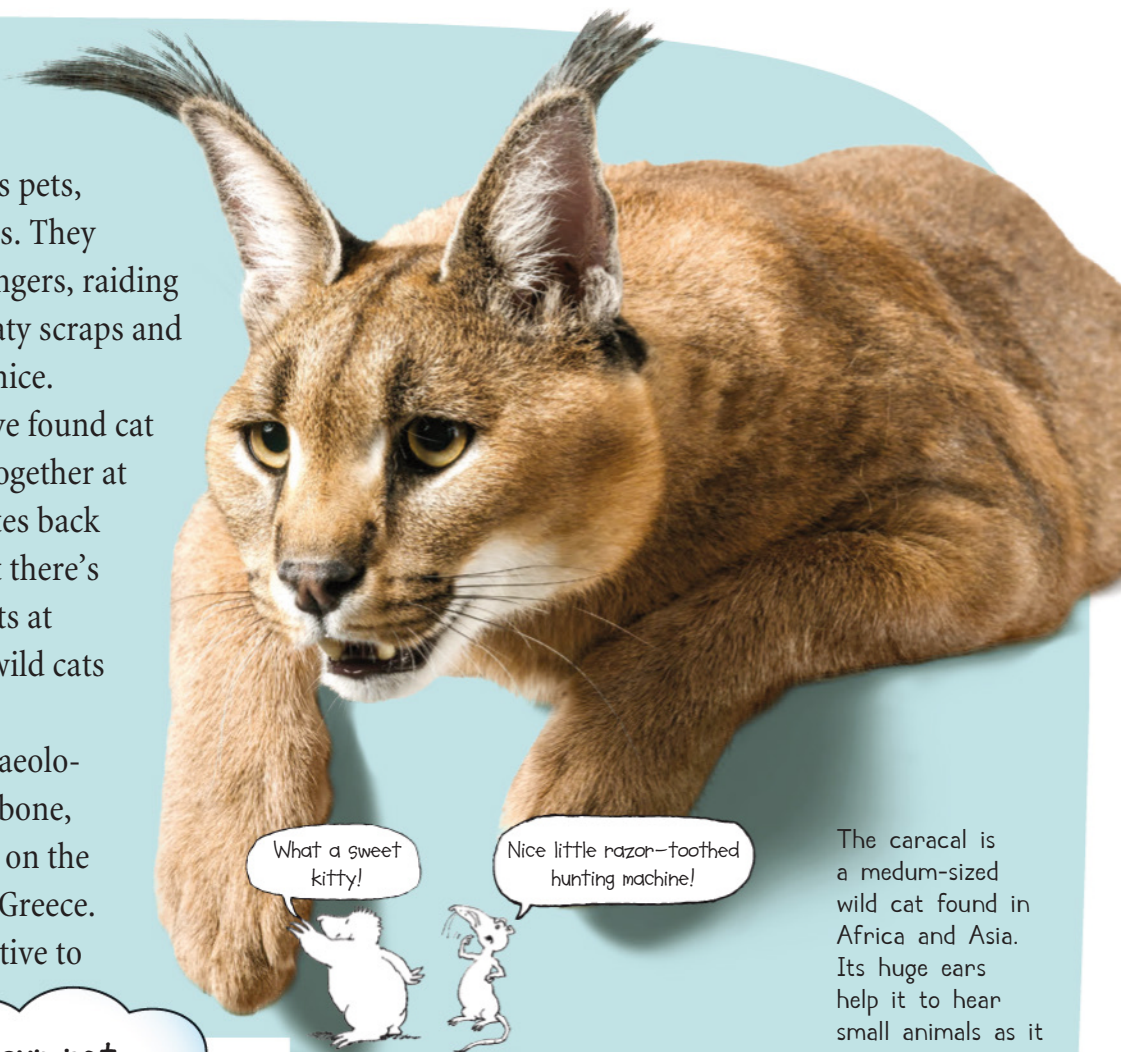
Wake me up when you are talking about me.



Thousands of years before they curled up by the fire as pets, cats lived near humans. They likely started as scavengers, raiding garbage heaps for meaty scraps and hunting for rats and mice.

Archaeologists have found cat and human remains together at a site in Israel that dates back about 8,000 years. But there's no way to tell if the cats at this site were pets or wild cats hunted for food.

Not long ago, archaeologists found a cat's jawbone, about 8,000 years old, on the island of Cyprus near Greece. Because cats aren't native to



The caracal is a medium-sized wild cat found in Africa and Asia. Its huge ears help it to hear small animals as it hunts at night.

Your pet inherited my good looks.



this island, humans probably took them there—maybe as pets.

People and cats were definitely making friends in ancient Egypt, about 5,000 years ago. Egyptians may have liked the cats because they eat pesky rats, mice, and snakes, or just because they are cute and furry. Maybe they left out small pots of milk to encourage the helpful hunters to stay.

I don't understand humans—first they chase us away, but then they leave tasty tidbits out for us.



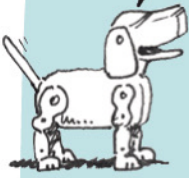
The ancestor of modern house cats probably looked a lot like this small African wildcat.

Queen Kitty

As time passed, the cat's importance in Egyptian religion and culture grew. Egyptian art shows cats sitting under chairs, playing, eating fish, and helping people hunt birds. Soon, cats even became sacred. The cat-goddess Bastet symbolized joy and love. Worshippers visited Bastet's temple in spring and celebrated by feasting, dancing, and singing.

Cats became popular pets. When a beloved cat died, family members shaved their eyebrows as a sign of mourning. Egyptians mummified their cats and buried them in special cemeteries.

They only worshipped cats because they didn't have robot dogs.



Egyptian homes displayed cat statues to honor the cat-goddess Bastet.



Ancient Egyptians often mummified their beloved cats, burying them with bowls of milk.

They valued cats so much that the penalty for killing one was death. And they made it illegal to export them. For a long time, this prevented the spread of domestic cats to other countries.

Cats for Everyone

Eventually, cats spread from Egypt to the rest of the world. Most experts believe they just walked out, following mice and trash heaps from village to village. They may have wandered onto boats that sailed the Mediterranean. Once cats got to Rome, they tagged along with the Roman armies, which marched all over Europe and into Asia.

In the Middle Ages, some superstitious Europeans believed cats were creatures sent by the devil. They suspected cats of black magic and told stories that cats carried witches on their backs to midnight meetings. Some believed witches turned themselves into cats. No longer gods or pampered pets, cats had to work for their food. They kept rat populations down in cities and on farms. And they stopped mice from munching manuscripts in monasteries.

Feel free to eat this book anytime.



Super, Natural

A cat prowls at dusk, stops suddenly, and swivels its ears, its eyes shining eerily. Then it runs off with a snarl, even though nothing seems to be there. What spooked it? To humans, this behavior can seem bizarre and a little scary. It may have led to stories about cats being able to see ghosts.

But the cat who runs from nothing has probably just seen or heard something you can't.

Cats have much sharper senses than humans. Cats can hear high-pitched sounds too faint for human ears to



detect—like the quiet cheeps and chirps of mice, or the nibbling of rabbits.

Their ears are shaped like satellite dishes and can swivel to catch faint sounds from any direction.

Cats also see much better in near-darkness, thanks to a reflective layer at the back of their eyes. This bounces more light into their pupils—and also gives their eyes a mysterious, spooky glow if you catch them in a flashlight beam.

Because cats sense things humans can't, they can sometimes seem supernatural. But what's really going on is completely natural—and pretty super!

Toward the end of the Middle Ages, cats started to regain their popularity. Taken along on explorers' ships to control mice, they left their paw prints, and kittens, all over the globe.

By the mid-1800s, people's love for cats bloomed again. Cat fanciers started to breed cats for long fur, or interesting colors, or short noses.

Now pet cats are prized more for their looks than their mousing skills. Have we finally tamed the fierce hunters into purring balls of love?

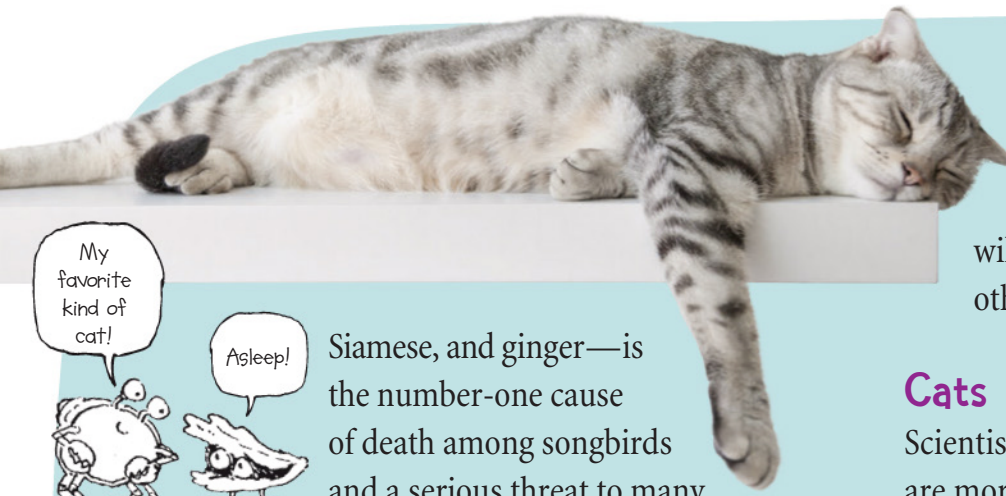
Cats for petting, not rat catching!



Cats Gone Wild

Today, domestic cats live everywhere (except in Antarctica, where they are banned). In fact, their adaptability and hunting skills rank them as one of the world's most invasive species. Being killed by cats—not by lions, leopards, and lynx, but by tabby,

This engraving from 1657 shows a cat asleep on the job. Wake up, kitty! Lunch is behind you!



Siamese, and ginger—is the number-one cause of death among songbirds and a serious threat to many native species around the world.

The wild cat lurks just under the surface of even the tamest cats. In fact, kittens need to be handled by humans when they are very young, or they will turn wild and can't be tamed.

Untamed feral (meaning “wild”) cats can be found all over the world, living in city alleys and dumps, on country farms, and around docks in seaports. Where food is plentiful, feral cats live in big colonies and raise wild kittens. Feral cats can be a big

problem—they can spread diseases to other animals and humans, they hunt wildlife, and they can crowd out other native cats.

Cats Rule

Scientists estimate that today there are more than 220 million pet cats, making them one of the most popular pets in the world—and that's not counting the millions of stray cats.

What's the secret of the cats' success? How did they charm us? Is it that they're cunning, independent, and powerful? Or that they're sleek, graceful, and soothing? Or do we find them so fascinating because they are both beauty and beast, both wild and mild, at the same time? 🐾



Meow!

Cats hiss, growl, and yowl—but adult cats don't meow to other cats. They meow only to get the attention of humans.

Humans are pretty bad at reading cat body language and smell signals. So cats have learned to call us with the noise that kittens make to get the attention of their mothers—*meeeow*.

Scientists think that each cat-human pair develops its own language of meows. One tone might mean “feed me,” another “let me out.” Some pleading meows have a whiny note that mimics a human baby's cry. But unlike cat body language, the meaning of these special meows isn't the same for every cat. Cats learn which meows get results from their own particular humans.





by Tiger Tabby

We cats are a good-looking bunch, if I do say so myself.

Dogs come in all kinds of weird shapes and sizes, but all pet cats have the same basic (and soooo handsome) body shape. That's because cats were never bred to work like dogs (though we do love to chase mice). Our only job is to look gorgeous! So humans figured out ways to give us many beautiful colors, patterns, and coats, and some rather silly-looking features.

How do they do that? Now and then, kittens are born with folded ears or dark coats or curly fur. Sometimes these oddball cats strike the fancy of humans, who then attempt to breed more cats with unusual traits. They do this by mating males and females who have the traits they want, which is called selective breeding. As a result, there are more than 40 different breeds of domestic cats in my family today.

But let's talk about ME, your basic tabby cat. The word *tabby* comes

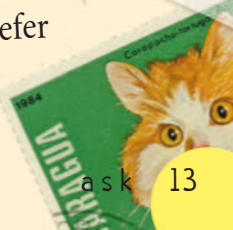
from *attabi*, a striped fabric made in Iraq. The earliest cat ancestors probably looked something like ME, and today some of my wild relatives in the forests and deserts wear the tabby pattern.

Actually, we tabbies aren't a single breed. No sirree. Tabby is an ancient pattern of stripes and spots that all cats share underneath, from alley cats to fancy-pants felines. Then why don't all cats look like ME? Well, the pattern comes from bands of color on each hair in a cat's coat. But, when hairs have bands that are all the same color, the pattern doesn't show. (How boring!) There are several tabby patterns; my stripy coat (gorgeous, eh?) is only one of them, and it's called *mackerel*, though I prefer **TIGER**.

TIGER TABBY'S
FAMILY PHOTOS



art by Amanda Shepherd





Uncle Fez



MEOW

Tiger 4 months old

ME. Wasn't I an adorable kitten?
The tabby pattern always includes
that elegant M on the forehead.
(Stands for ME, no doubt.)

Talk about FUR! My Persian uncle has
enough for three cats. And don't let
his frowny face fool you. He looks
fierce, but he's really a cupcake.



Princess Pim



You'd hardly guess this
loudmouth Siamese is
descended from the Royal
Cats of Siam. Man, can
she talk! Pim's "points," the
distinctive color on her
head, feet, and tail, make
her particularly beautiful—
and she knows it.

This is a nice photo
of my American curl
relatives. Sally, Sue, TJ,
and Bob always look a
little startled—but I
would too, if my ears
curled back.

You will receive plenty of string
from your family

ADOPT 2357

Cousin Angus



Cousin Angus wants you to think he's the boss, but mostly he's a lot of fun. His Scottish grandma was born with her ears folded over, so everyone on her side of the family has them. They're called Scottish folds.

Curly



Never a bad hair day for my second cousin, a Devon rex named Curly. His tightly curled fur always has that just-styled look. He claims those lovely locks come from his gramps, who was born that way on a farm in England.

Auntie Manxine



I'm really fond of Auntie Manxine, even though she looks a little, well, unfinished. She's a Manx from England, where her friends call her "Rumpy" since she has no tail at all. Some Manx cats have little stumps for tails. Guess what they're called.

Babette



The sphinxes come from Canada originally, where they must be chilly since their velvety skin has only a little fuzz in spots. This is Babette—you gotta fight her for sunny spots at family reunions. Love that pose!



Born to Hunt

by Meg Moss, art by Laurie O'Keefe

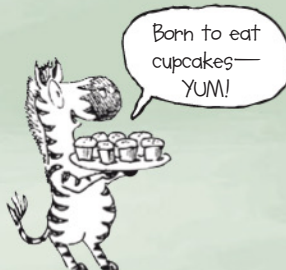
Cats have very sharp **eyes**, which see well in dim light. Cats don't see much color, but they are very good at spotting movement. As with most predators, a cat's eyes both face forward. This helps it see shapes and judge distance.

Spots and stripes help cats hide in jungles or tall grass.

Connected to nerves under its skin, a cat's **whiskers** are highly sensitive to touch. A cat's front whiskers grow about as wide as its body. If its whiskers can fit through an opening, then the cat knows its whole body can too. Whiskers can also feel air movement. This helps the cat navigate around obstacles in the dark.

A cat's flexible **ears** can turn separately to point in different directions. That means the cat can aim its ears without turning its head to spot exactly where a sound is coming from.

Foot pads help make cats stealthy and sneaky.

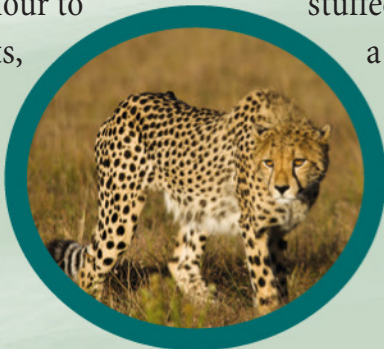


Big or small, all cats eat meat. And their bodies, inside and out, have evolved to stalk and hunt prey.

On the outside, a cheetah and a tabby cat have much in common. The cheetah is a runner—the fastest mammal on earth. It can sprint up to 70 miles (113 km) an hour to chase down its prey. Most other cats,

big and small, prefer to sneak up and pounce upon their targets. But even house cats can put on a burst of speed when they want to.

Compare some of the features of this powerful cheetah with a kitty cat you may know. And next time Pusskins attacks that stuffed mouse, stand back and watch a natural hunter in action.



With its **narrow, flexible body** and **small head**, a cat can fit into small places or sneak through dense shrubbery (or behind the couch) to surprise prey.

A cat uses its **tail** for balance, but only domestic cats walk with their tails straight up. Wild cats hold their tails in a low curve behind them.



Most cats' **claws** retract, hiding inside their foot pads until needed. But a cheetah's claws are always extended to help it grip the ground when running.

To extend its claws, a cat uses muscles to tighten tendons attached to each claw. When the cat relaxes its foot, its claws draw back.

Sharp claws help a cat catch, hold, and tear prey. They are also good for climbing trees. But because its claws curve inward, a cat has difficulty climbing back down a tree once it's up.

Inside a Hunter

Your pet cat may just stand around at dinnertime while you pour the kibble, but under that mild-mannered ball of fluff beats the heart of a hunter. On the inside, she still has what it takes to track down, kill, and

digest a meaty meal, just like her wild cousins. And while it doesn't take much skill to bring down a can of cat food, her strong hunting instinct makes Pusskins a good mouser. Any small moving thing is enough to wake up the hunter inside—even a bit of string.

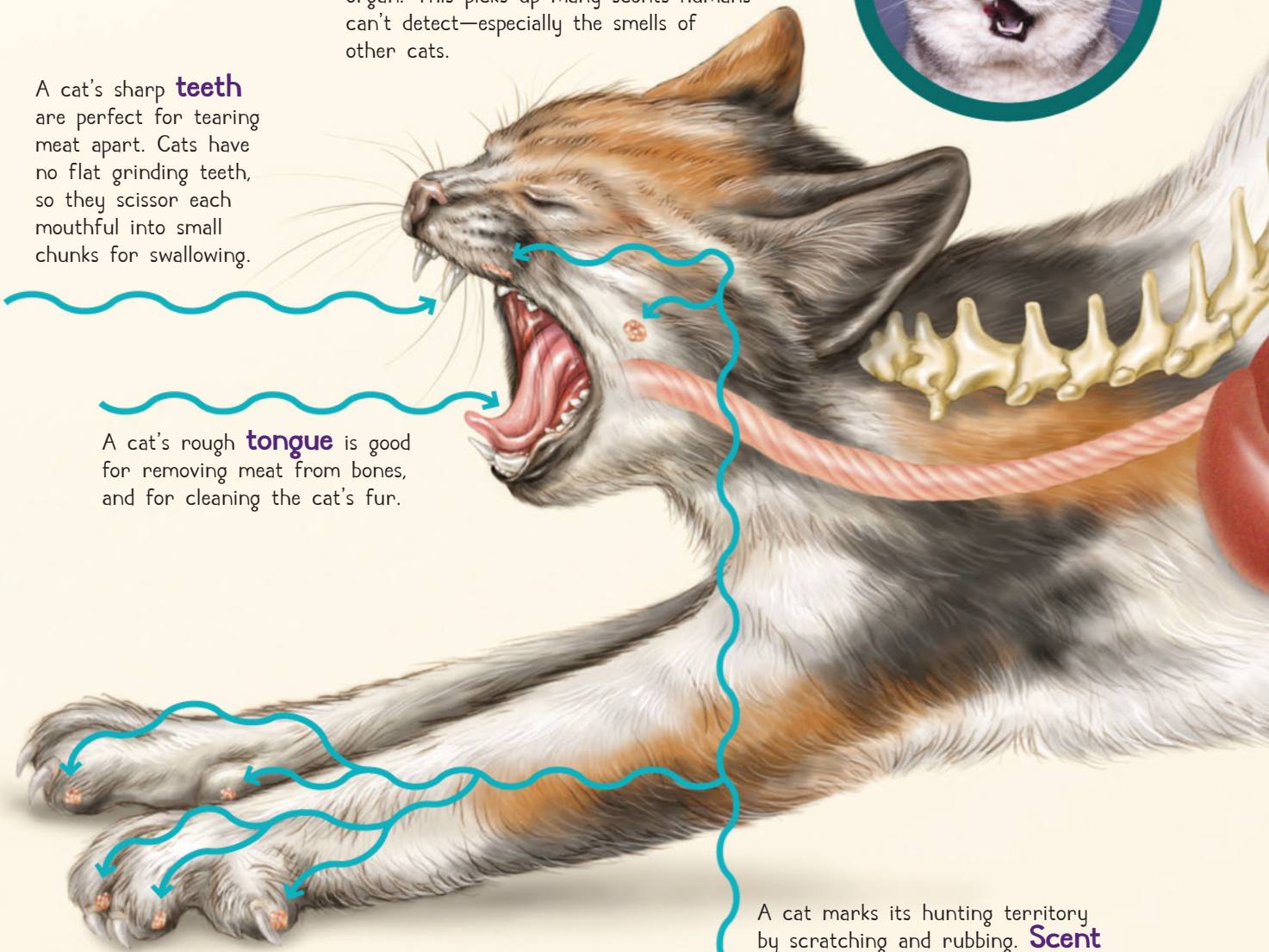
Smiling or smelling?

A cat with an open mouth may actually be sniffing an interesting smell, using a powerful smell sensor in the roof of its mouth, called the Jacobson's organ. This picks up many scents humans can't detect—especially the smells of other cats.



A cat's sharp **teeth** are perfect for tearing meat apart. Cats have no flat grinding teeth, so they scissor each mouthful into small chunks for swallowing.

A cat's rough **tongue** is good for removing meat from bones, and for cleaning the cat's fur.



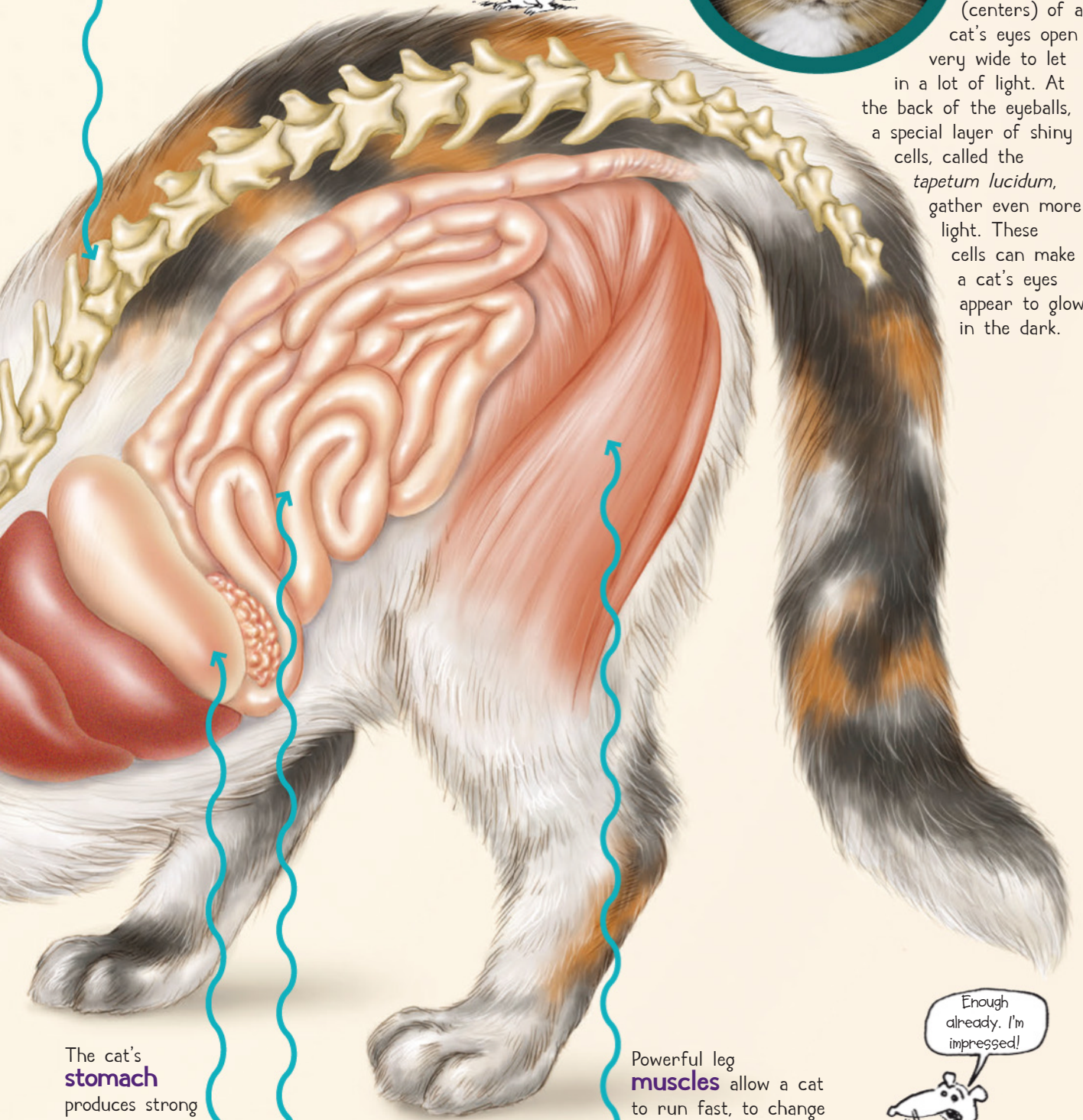
A cat marks its hunting territory by scratching and rubbing. **Scent glands** in its cheeks and foot pads leave a smell that warns intruders away. Some cats spray their urine around for the same reason.

This picture shows only some of the cat's insides. You don't see the heart, lungs, kidneys, and other organs, but cats have those too.

A cat's flexible **spine** enables it to jump and land with ease. If it falls from a high place, a cat can usually twist its body around so that it lands on its feet.



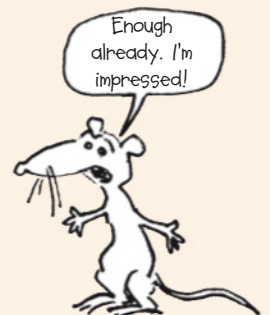
A cat's **eyes** are made for night. To help it hunt in the dark, the pupils (centers) of a cat's eyes open very wide to let in a lot of light. At the back of the eyeballs, a special layer of shiny cells, called the *tapetum lucidum*, gather even more light. These cells can make a cat's eyes appear to glow in the dark.



The cat's **stomach** produces strong juices to break down large pieces of meat and even bone.

House cats have longer **intestines** than wild cats, to help them digest cat food that may not be all meat.

Powerful leg **muscles** allow a cat to run fast, to change direction quickly, and to jump five times its height.



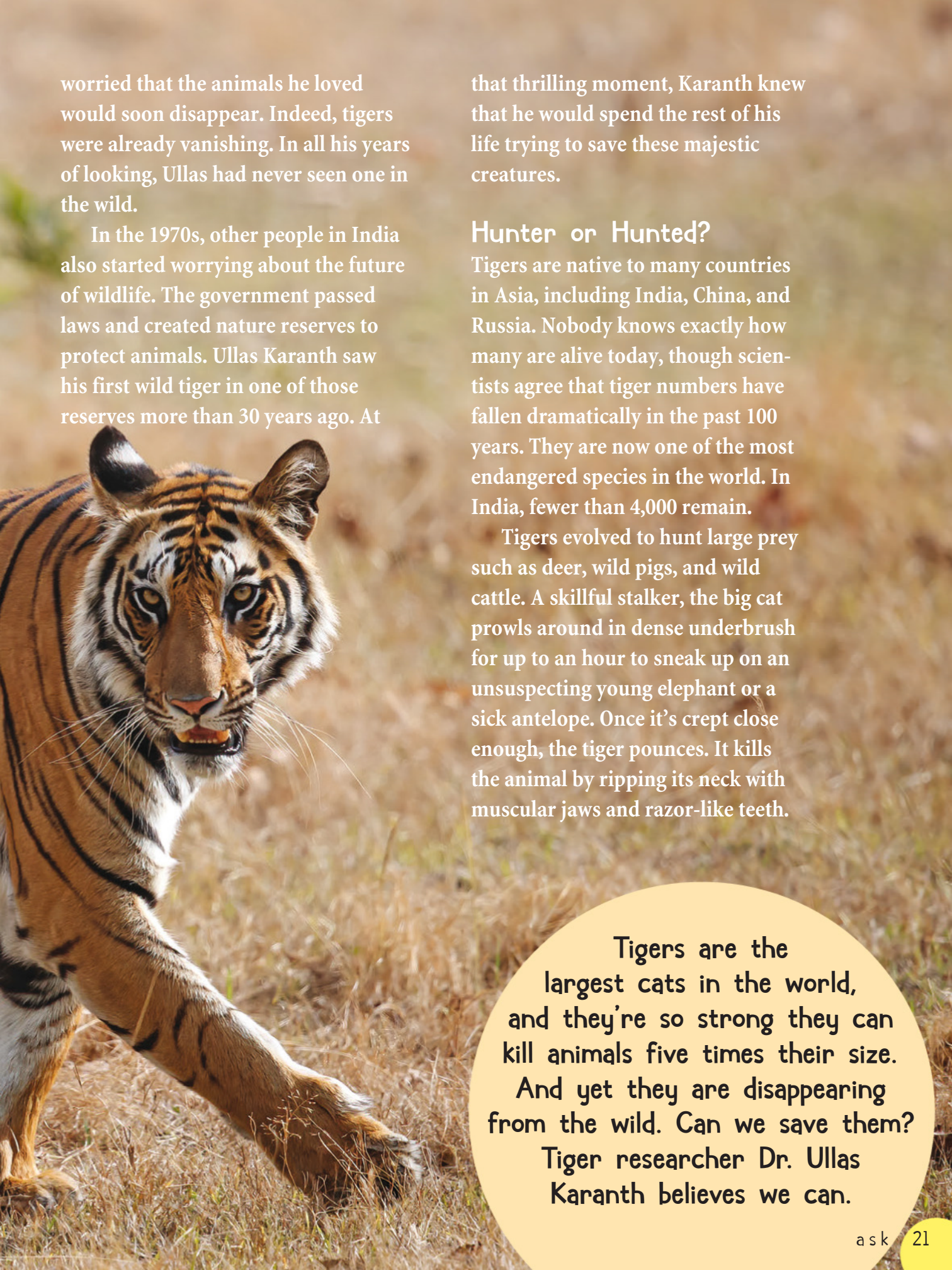
SAVING the TIGERS

by Cynthia Graber

When he was a young boy living in a village in southwest India, Ullas Karanth saw wildlife all around. Elephants and leopards roamed the mountains nearby. He spent hours bird-watching.

But as Ullas grew up, he saw forests cut down all around India. Because animals cannot survive when their habitats, or natural homes, are destroyed, Ullas



A tiger is walking towards the viewer through dry, yellowish-brown grass. The tiger has orange fur with black stripes and a white underbelly. Its mouth is slightly open, showing its teeth. The background is a soft-focus field of similar grass.

worried that the animals he loved would soon disappear. Indeed, tigers were already vanishing. In all his years of looking, Ullas had never seen one in the wild.

In the 1970s, other people in India also started worrying about the future of wildlife. The government passed laws and created nature reserves to protect animals. Ullas Karanth saw his first wild tiger in one of those reserves more than 30 years ago. At

that thrilling moment, Karanth knew that he would spend the rest of his life trying to save these majestic creatures.

Hunter or Hunted?

Tigers are native to many countries in Asia, including India, China, and Russia. Nobody knows exactly how many are alive today, though scientists agree that tiger numbers have fallen dramatically in the past 100 years. They are now one of the most endangered species in the world. In India, fewer than 4,000 remain.

Tigers evolved to hunt large prey such as deer, wild pigs, and wild cattle. A skillful stalker, the big cat prowls around in dense underbrush for up to an hour to sneak up on an unsuspecting young elephant or a sick antelope. Once it's crept close enough, the tiger pounces. It kills the animal by ripping its neck with muscular jaws and razor-like teeth.

Tigers are the largest cats in the world, and they're so strong they can kill animals five times their size. And yet they are disappearing from the wild. Can we save them? Tiger researcher Dr. Ullas Karanth believes we can.



Bengal tigers, the type found in India, can weigh 500 pounds (227 kg). They roam the forests alone hunting, sometimes climbing trees if they feel threatened. They use their powerful jaws and sharp teeth to stab and hold prey by the neck. If two tigers meet, they may fight to settle whose territory it is.

But even with these skills, tigers are no match for the most ferocious hunters of all: humans.

For hundreds of years, people hunted tigers because the cats ate livestock, and sometimes even people. (Tiger attacks are rare—like most wild animals, tigers prefer to avoid humans.) Guns made killing even easier, and hunters in the 1800s and 1900s showed off their shooting skills by bagging the great cats.

Today, even though laws forbid killing tigers, some people still do. Most tigers are killed by poachers who hunt them illegally. Poachers hope to make money by selling tiger

skins and body parts, which people in China and Southeast

Asia believe can cure a variety of diseases. In India too, some people think eating tiger meat promotes good health.

Room to Roam

But something worse than guns is killing tigers today: they are losing their homes. Tigers may live in green rainforests thick with huge trees, or in more open areas filled with high grasses. But there are two things a tiger cannot live without: a large area in which to roam and a good source of clean water.

Tiger, Tiger,
burning bright,
in the forests
of the night!
I wish I may,
I wish I might,
be far away
when those
teeth bite!





Today, there are more tigers living in zoos than in the wild.

In India, some people share the forests with tigers, living in small villages, collecting wood for fires, and hunting deer and other wild animals. They compete with tigers for food. Areas that have been over-hunted are called empty forests. Without food to eat, tigers in empty forests starve.

People also compete with tigers for land. Farmers cut down forests and plow up grasslands to make bigger farms. Governments clear land to build roads and dams. The result is that only a tiny bit of land is left for the tigers.

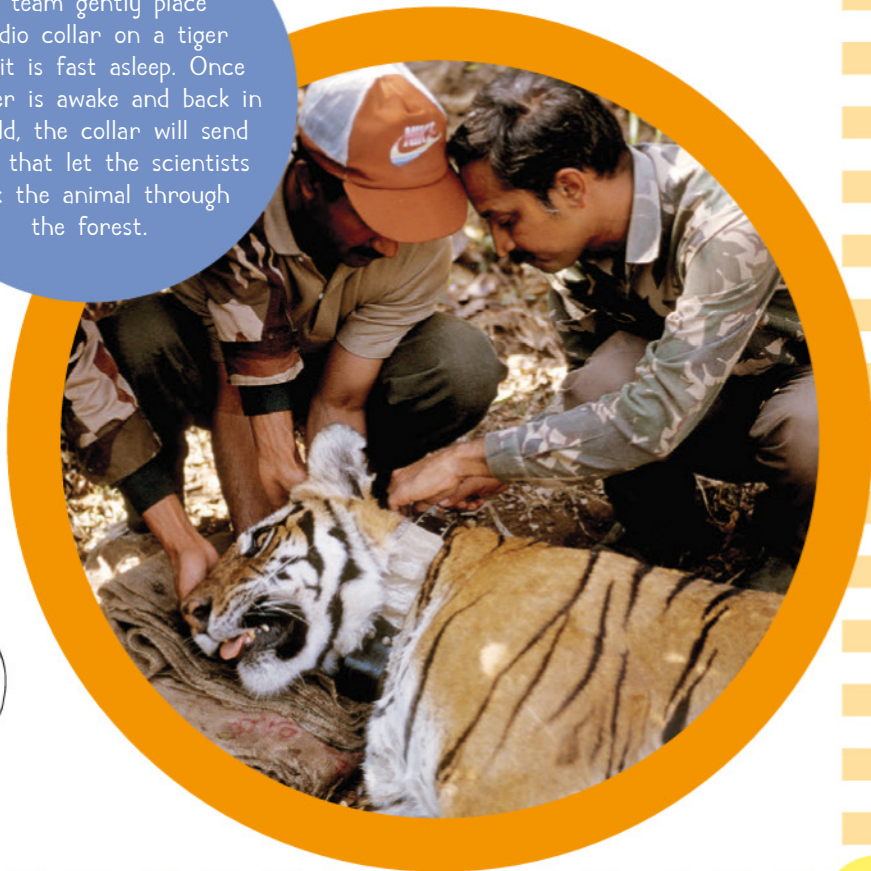
“Freeing up space for tigers is the single biggest challenge we

have,” says Karanth. “We can’t have people grazing their livestock or going into the forests to kill deer and pig if we want to have tigers.”

To the Rescue

In the past, most wild animals existed without any human help. But with so few tigers left today, we have to step in and protect the animals to prevent them from disappearing forever. Karanth believes that science provides the best tools for saving these endangered cats. He hopes that studying tigers can give scientists and

Karanth (right) and his team gently place a radio collar on a tiger while it is fast asleep. Once the tiger is awake and back in the wild, the collar will send signals that let the scientists track the animal through the forest.



Save the trees!



Save the grasslands too!





Tigers hunt at night, following their favorite trails through the forest. To capture them on film, Karanth sets up cameras along the paths. As darkness falls, the tigers begin their nightly rounds. Silently, a family moves down a path, crossing in front of the camera's sensor. A quick flash, and the camera has taken a perfect portrait of the prowling predator and her cubs.



the tiger through the forest, learning how far it goes and what food it eats.

conservationists the information they need to work with governments to save the tigers and their forests.

Karanth's first project was to count the animals that tigers eat. The availability of tiger food told him how many tigers might be able to survive in the forest.

Then, of course, Karanth needed to count tigers. But how? One way is to collar them—not an easy thing to do! From up in a tree near a tiger kill, Karanth darts the tiger with a mild sleeping drug. Once it's asleep, he places a radio collar around its neck. That collar allows him to track

Another way Karanth counts tigers is to set up special cameras along animal paths. When a tiger crosses in front of a sensor, it triggers a camera that snaps a picture. Every tiger has a different stripe pattern. Computers can scan the photographs, identify each tiger by its stripes, and count individuals.

Wild tigers hiding in the jungle can be very hard to spot. It's easier to find their poop, or scat. Poop contains tiny traces of DNA from the tiger who left it. So by looking at scat from a particular area, researchers

Could you put on this beautiful decorative collar, please? It's for my science project.



Each zebra has its own stripe pattern too.



can track individuals and count how many there are.

By counting tigers and their food, Karanth has found that, although many tigers die every year, many cubs are being born. As long as the mothers have enough space to hunt in and prey to eat, the cubs will have enough food to survive. If the cubs survive to become adults, the number of tigers will increase.

The Indian government is using Karanth's findings to make plans to save the tigers. They've outlawed hunting in many areas, hired guards to protect tigers, and protected some forests as tiger habitat. It's also important to find good jobs outside the forests for people who today live inside the forests, so they won't be tempted to hunt tigers or kill the animals the tigers need for food.

Karanth and other researchers will keep watching and counting to see if the conservation plans are working. So far, they think they are—India's wild tiger population is now the largest in the world. But the World Wildlife Fund estimates that in the whole world, there are only about 5,570 wild tigers left.

Not Too Late

Ullas Karanth believes that we should protect

tigers because every species on the planet is connected. That means that in some way, we too depend on tigers, as we do on all species in the web of life. He explains that if people were to destroy the famous Indian building called the Taj Mahal, it could be rebuilt. "But once we destroy all these intricate ecological webs," he says, "there's no bringing them back!"

"What we do today can have a huge influence," Karanth says with enthusiasm. "Kids shouldn't lose hope, because we still have an opportunity to save the world's tigers!" 🐅

Just like a house cat, a mother tiger carries her babies by holding them by the loose skin at the scruff of their necks. Tiger cubs are born in litters of two to four. They remain with their mother until they are about two years old, when they can hunt for themselves.



How to Speak CAT

art by Sue Blanchard



Hello! How are you?

A cat with her tail straight up is saying hello. When friendly cats meet, they may rub past each other and entwine tails.



Cat kiss

When a cat blinks at you slowly, that's a cat kiss! If you blink back slowly, she may do it again.



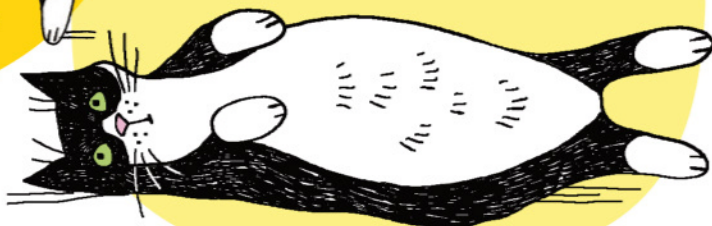
Mine, Mine, Mine

Cats rub their heads and bodies on things (and you) to spread their scent around. This marks the rubbed object as "theirs," like a name sticker. The smell also tells other cats a bit about her. Scratching is like an exclamation point—Look! Here I Am! Sometimes cats also spray pee at cat-nose height as a signal to other cats.



I trust you not to rub my belly.

Most cats don't like being touched on their stomachs. When they roll over and show their tummies, it's a way of saying "I trust you." But unlike dogs, cats are not asking for a belly rub.



Cats hiss when they're angry, meow to get our attention, and purr when they're happy (or to comfort themselves).

But cats mostly show what they're feeling with body language. With practice, you can learn to read these

cues too. When you see a cat, look at how she holds herself. Does she look tense or relaxed? Are her ears perked, or moving around, or flat? Is the tail twitching with excitement? Even when she's silent, your cat is saying plenty!

That is SO interesting!

When a cat opens her eyes wide and perks up her ears, she's very interested in something (maybe a bird or mouse). She may look relaxed, but a twitching tail tip will betray her excitement.



Hunting A cat stalking prey crouches low and holds her tail out straight, with her whiskers forward in "detector" mode.



Annoyed

If her tail is swishing around, watch out—this cat is annoyed. Cats use stare-downs to settle who's boss, so remember it's not polite to stare.



Worried A cat hunched up with flattened ears and her tail tucked in is feeling anxious. A frightened cat's first instinct is to run away, curl up small, and hide.



Leave me alone!

When a cat flattens her ears and hisses, she's feeling threatened and may bite. Back off!



Cat's last stand

A terrified cat with nowhere to hide will try to make herself look big and scary by bushing out all her fur, arching her back, and showing her teeth. She's trying to scare off whatever is scaring her.



Some cats love boxes...even when the boxes aren't real.

Do you have a cat that likes to squeeze into small, cozy spaces, like a box? Did you know some cats will also curl up in a box-shaped, square outline on the floor? Scientist Gabriella Smith used citizen science to test it!

Volunteers made a pretend box on the floor using tape or paper shapes that created the illusion of a square. Then they filmed their cats any time the cats checked out the "box" over six days. (The volunteers wore sunglasses so they wouldn't accidentally signal the cat where to go by looking there.)

Cats do what they want, so in the end, only 30 completed the experiment. But those 30 sat in the pretend box just as often as they sat in a real one. They also sat in the pretend box more often than in an empty space without any box-like markings.



What's citizen science?

It's when ordinary people help collect information and send it to scientists.



Scientists don't know exactly why cats like boxes. It might be because the sides of the

box remind them of being snuggled by their sisters and brothers when they were babies. Or they could be attracted to it because cats hide to stalk prey. But neither of those reasons explains why cats sit in a pretend box, and the cats aren't telling why.

If you have a cat and some masking tape, you can try it too! (Ask your parents first to make sure it's OK.) Put masking tape on the floor in a rectangle or a square that's slightly bigger than your cat. Leave the tape there for several days and see what happens. Does your cat sit in it? 🐾

If I Fits, I Sits

by Tracy Vonder Brink

ASK JIMMY & THE BUG

Hey, Jimmy! Ella, Mia, Noah, and Lana B. in California want to know, why do rafflesia flowers smell so bad? And why are flies attracted to stinky stuff?

Words by Ellen R. Braaf, Pictures by Dean Stanton

Rafflesia flowers—nicknamed “corpse flowers”—are the largest flowers in the world. And they reek like rotting flesh. Even their huge, warty petals look like decaying meat. But stink is good if you need to attract flies.

Why would anyone need to attract flies?

Just like bees, flies are pollinators. They help plants reproduce—quite by accident. As a fly goes from one bloom to another, pollen grains from one rafflesia flower stick to the fly’s body and hitch a ride to another rafflesia. The pollen combines with egg cells there to form seeds that can grow into new plants.

Ok...But why do flies like the smell of rotting meat?

Flies lay their eggs in rotting meat, garbage, and animal poop. It sounds gross, but these are good sources of food for hungry fly larvae (also known as maggots). For them, it’s like being born in a fly supermarket. Rafflesias are sneaky. They smell like rotting flesh to fool flies into thinking they’ve found a good egg-laying spot.

Sometimes, love stinks.

But they haven’t. What a sneaky flower trick!

Have a Question?
BUG us anytime!

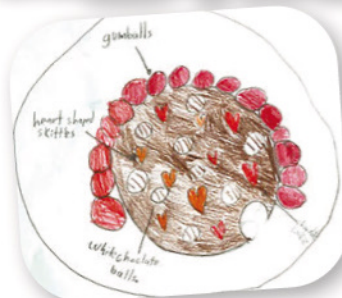
ask@cricketmedia.com

CONTEST and LETTERS

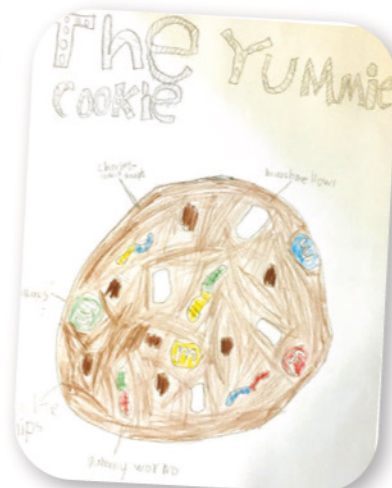


Send your letters to Ask at ask@cricketmedia.com.

In our September issue we asked you to make an ad for the most amazing, wonderful, delicious cookie EVER. Thanks to all you brilliant bakers for sending us your cookie creations.



The Perfect Cookie
Morgan M., age 8,
North Carolina



Bruce F., age 7, Ohio



Ella M., age 10



Anna B., age 11, South Carolina



Iris S., age 15, Texas

Dear Ask,
My name is Phoebe, and I'm six years old. And I want to know how tissue paper is made.

Thanks,
Phoebe

Dear Phoebe,
Tissue paper is made much the same way as regular paper, with a few special treatments to make it softer or more

absorbent. The process starts with wood fibers or recycled paper. They get ground up and mixed with water and chemicals to break them down into a mushy slurry called pulp. The pulp gets cleaned, pressed, and heated to turn it into dry, flat, thin paper. That paper then goes through machines that soften it, perforate it, cut it into sheets or strips, and

package it onto rolls or into boxes, depending on whether the tissues are meant for the toilet, the face, or wrapping gifts.

On a roll,

Bone Pony

P.S. Did you hear the joke about toilet paper? Never mind. It's tear-able!

P.P.S. Do you have a favorite joke? Send it in!



Louise, age 11, North Carolina

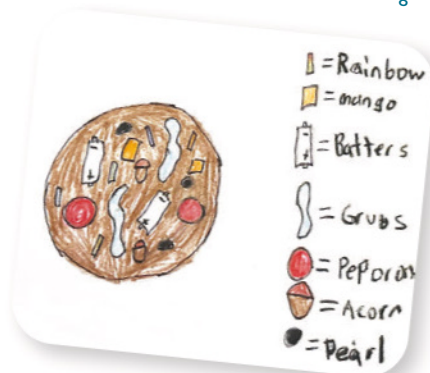


Lily T., age 7, Maryland



Isabelle D., age 9, Texas

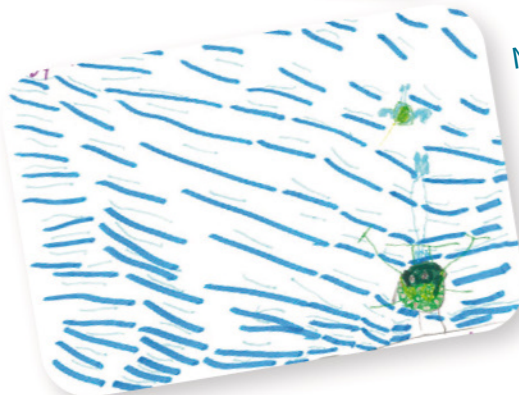
Molly, age 7, Maryland



Luna, age 11, Wisconsin



Rosalie D., age 11, Texas



Miles M., age 5

Dear Zia,
I know you love to get mail, so I thought I'd send you this Valentine wish by mail instead of in person.

Roses are red. Violets are blue.

Sugar is sweet, and so are you!

Happy Valentine's Day!

Your friend,

Elvis



Dear Elvis,
Thank you! I do love getting mail! And I love your poems! Will you send me some more? Pretty please.

Love,
Zia



February Contest

art by Amanda Shepherd

Cats or Dogs?

Some people think cats make the most perfect pets. Other people prefer dogs, or snakes, or birds, or fish. Where do you stand? For this month's contest, make a poster to convince someone looking for a pet why cats are better than dogs, or dogs are better than cats, or why your own favorite odd animal actually makes the best pet. Win us over, and we'll post a parade of the most persuasive pets in an upcoming issue of *Ask*.



Contest Rules:

1. Your contest entry must be your very own work. Ideas and words should not be copied.
2. Be sure to include your name, age, and address on your entry.
3. Only one entry per person, please.
4. Your entry must be signed or emailed by a parent or legal guardian, saying it's your own work and that no one helped you, and that *Ask* has permission to publish it in print and online.
5. For information on the Children's Online Privacy Protection Act, see the Privacy Policy page at cricketmedia.com.
6. Email a photo or scan of artwork to ask@cricketmedia.com. Entries must be emailed by February 28, 2025.
7. We will publish the winning entries in an upcoming issue of *Ask*.



Cricket

We Love Our Readers!

Download our free printable valentines at cricketmedia.com/valentine.

PERFECT PROJECTS

by Erica Huntzinger

Arched Cat House

Make a cozy house for your favorite cat.

What you'll need

- 1 shoebox
- 2 medium-sized cardboard boxes
- Masking tape
- Scissors (and maybe a grown-up to help cut the cardboard)

Paint, glue, markers, colored paper, or magazines for decorating

What to do

1. Flatten one cardboard box to make a long base. Tape the shoebox on top. Our shoebox had an attached lid that we taped to the cardboard base to make a ramp to get into the shoebox. If your lid is separate, tape it to the shoebox and the base if you want a ramp.



2. Flatten the second cardboard box, and fold it lengthwise in a few places so it will arch over the top of the shoebox



and the cardboard base. Tape this arched roof to your base.

If your roof needs support, tape another piece of cardboard inside as a pillar for strength. Add extra tape where you need to and trim anything you don't like.



3. Decorate! We painted our house blue because that is one of the colors cats see best. (They have a hard time with red.) We finished by putting a soft fuzzy blanket inside the shoebox to make it comfy for sleeping. Our cat friend Fabrette loved her house.

Happy cat house making!





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